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ABSTRACT

An evaluation of mathematics programs in Allen County, Kentucky focused on the COMPS program. The main research questions were: (1) Was the COMPS mathematics program effective for grades seven and eight in terms of increasing mathematics achievement and being favorably evaluated by former students? and (2) Was the program equally effective at various levels of ability. Answers to both questions were affirmative. The report also indicates that better students reported learning more in COMPS than did poorer pupils, and girls reported learning more than boys. Generally students liked the COMPS program, learned a lot from it, and wanted to keep it. However, when given the chance to extend the program to other grades, the pupils did not vote overwhelmingly to do so. (MP)

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EVALUATING THE SEVENTH AND EIGHTH GRADE COMPS PROGRAM IN TERMS OF STUDENT LEARNING AND STUDENT ATTITUDE

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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PREPS RESEARCH PROJECT

1978 - 79

Allen County School System
Allen County, Kentucky

REPORT PREPARED BY:

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FORWARD

This document is the final report of a PREPS project conducted by the PREPS Research Team of the Professional Development Network housed at Western Kentucky University and the following people in the Allen County School System: Cecil Calvert, Title I Coordinator; Linda Cline, Supervisor; Ovaletta Haven, Supervisor; Bennie Keen, Principal; Paul Foster, Principal; Larry Williams, Director of Pupil Personnel; Pearl Sikes, Guidance Counselor; and Leatrice Cornwell, Guidance Assistant.

The Allen County personnel had major responsibilities in the design and data collection phases of this project. Their input is greatly appreciated by the PREPS staff.

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The mean scores of the matched sample were similar indicating that the matching was successful (74.0 COMPS and 73.8 non-COMPS). The math achievement test especially administered to these students just before mid-year showed about a one point difference favoring the COMPS students (62.6 COMPS and 61.7 non-COMPS). This difference was not statistically significant.

Comparing Last Years' Eighth Grade COMPS Students and the Previous Years' Eighth Grade non-COMPS Students

When the current ninth and tenth grade students' seventh grade math raw scores were compared it was found that the groups had unequal math achievement (62.6 COMPS and 64.5 non-COMPS). This indicated that the students involved in eighth grade COMPS during the 1977-78 school year began approximately two points below students in the 1976-77 school year eighth grade non-COMPS class. At the end of the eighth grade the means of the two groups were 72.5 (COMPS) and 71.6 (non-COMPS). These data indicate that the eighth grade COMPS class "caught up" and slightly surpassed the non-COMPS eighth grade class. These mean differences were statistically non-significant.

Because the two eighth grade classes did not have similar seventh grade math scores it was decided that a better comparison of the math programs could be made by comparing a matched sample of eighth grade students based on their seventh grade math achievement. The seventh grade means for the matched groups were 62.3 (COMPS) and 62.5 (non-COMPS) indicating the matching had been successful. The posttest means for the eighth grade data were 72.8 (COMPS) and 65.8 (non-COMPS) -- a seven point difference favoring the COMPS students. This difference was significant at the 0.10 level of confidence using a one-tailed test. It was not significant at the previously selected 0.05 level of significance.

Interpretation of the Math Data Comparing COMPS and Non-COMPS Students

Although statistical significance was not reached for any analysis at the 0.05 level, all three of the analyses favored the COMPS math program: (1) the matched sample of seventh grade students showed a one point gain favoring the COMPS students (one-half year in the different math program), (2) the total groups of COMPS eighth grade students began two points below non-COMPS students and ended one point above non-COMPS students (one full year in the different math program), and (3) a seven point difference was found in math achievement favoring the COMPS matched sample of eighth grade students (one full year in the different math program). Taken together the data appears to indicate that COMPS did increase student learning and that the COMPS program was more effective when experienced for a full year.

2. Did seventh or eighth grade youth enrolled in the COMPS Math program score significantly higher in science and reading achievement than seventh and eighth grade youth not enrolled in the COMPS Math program?

Student gains in reading and science were also evaluated for seventh and eighth grade COMPS and non-COMPS students to determine whether other subject areas might also have increased for the COMPS students. Eighth grade COMPS and non-COMPS students began with similar reading and science scores (reading means -- 51.6 COMPS and 50.9 non-COMPS; science means -- 49.9 COMPS and 49.8 non-COMPS). The reading and science scores after the eighth grade showed a slight increase favoring the COMPS students (reading means -- 57.0 COMPS and 54.9 non-COMPS; science means -- 52.9 COMPS and 51.6 non-COMPS). These differences were not significant.

The present seventh grade class who experienced a half-year of COMPS or non-COMPS math showed similar reading and science gains. The students assigned to the COMPS program initially scored five points higher than non-COMPS students in both reading and science. These gains were increased a further five points for reading and one point for science during the half-year in COMPS. These increases were not statistically significant.

Interpretation of the Reading and Science Data Comparing COMPS and non-COMPS Students

The data would appear to indicate that students assigned to COMPS increased in reading achievement. Although this reading gain cannot be directly associated with instruction received in the COMPS program it should be noted that the findings (although non-significant) favored the COMPS program in both analyses. Science achievement scores were not related to type of math instruction received.

3. *Is there a relationship between academic ability and achievement gain in the COMPS program?*

Separate t-tests were calculated for three levels of academic ability to determine whether significant learning had taken place for each of the three groups. The groups were formed in the following manner:

Group 1 - all students with academic ability less than 95,
Group 2 - students with academic ability between 95 and 105,
Group 3 - students with academic ability of 105 and better.

The mean gain scores for the three groups were as follows: (1) 7.9, (2) 9.4, and (3) 12.2. Each of the t-tests were significant at the .05 level.

Interpretation of Math Gain and Academic Ability

The data indicate that significant learning gains were made for students in all ability ranges. It is generally expected that students with higher academic ability learn at a faster rate than students of lower ability. Holding this in mind it is interesting to contrast the mean gain score of the lowest and medium academic ability groups (groups 1 and 2). Their mean gain score differs by 1.5 points which is less than might be expected. The study of student attitudes towards COMPS indicates that students who had reported receiving lower math grades in prior years were the most positive about the COMPS program. These two data appear to indicate that the COMPS program was positive for all students but was especially helpful to students with low academic ability with a history of lower math grades.

4. Did ninth grade youth evaluate their eighth grade COMPS experience favorably?

Twenty questions were asked of the current ninth grade students (last years' COMPS students) to probe their attitude towards their eighth grade COMPS program. Of the 20 questions all but five were written so that a positive response would support the COMPS program. Questions 10, 18, and 19 would have required high negative responses to have supported the COMPS program. Questions 15 and 20 were specialized questions and will be described separately at the end of this section. Positive responses are defined as either strongly or moderately agreeing with the statement. Negative responses are defined as either moderately or strong disagreeing with the statements.. The middle response category was a neutral point reflecting a lack of opinion. The percent of responses for each question in each response category can be found in Table 1.

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Three questions had at least seventy percent responses favoring the COMPS program. These questions were (1) Question 1, "I liked the COMPS program in 8th grade" - 71.6 percent positive responses, (2) Question 2, "I felt I learned a lot of math last year" - 75.3 percent positive responses, and (3) Question 11, "I enjoyed working in the small groups" - 72.4 percent positive responses.

Two questions had approximately fifth percent of responses favoring the COMPS program. These questions were: (1) Question 3, "It was easier for me to learn in last years' math class than it was in any other year" - 51.9 percent positive responses, and (2) Question 10, "I had to memorize a good deal more in last years' math class than I do in this years' class" - 52.4 percent negative responses.

COMPS questions that received less responses favoring than not favoring COMPS were questions 5, 6, 7, 8, 9, 12, 14, 16, and 19. In only one case did the responses not favoring COMPS exceed fifth percent of the total number of responses. This condition was possible because a high proportion of responses fell within the neutral response category. These questions tended to ask students whether COMPS was better than other math programs in specific ways. Therefore, negative responses do not necessarily mean that COMPS was perceived as a poorer method of teaching math but rather reflect areas in which COMPS students did not find it superior to previous math programs.

The survey data was analyzed for sex differences, grade differences (as reported by the student), and retention history of the student.

Girls reported learning more in COMPS than boys. Boys reported (1) enjoying small groups more, (2) having more time to finish problems, (3) having too much practice, and (4) wanting a text to a greater extent than girls.

Grade differences showed that better students reported more learning in COMPS than did poorer students. Poorer students reported (1) that COMPS was more interesting, (2) COMPS problems were easier to figure out and more enjoyable to work, (3) they wanted more COMPS programs, (4) instruction as easier to understand, (5) easier homework assignment with more time available to complete assignments, and (6) more trouble changing over to a non-COMPS program.

There were sharp contrasts in A and D students on two questions: (1) A students reported an overabundance of practice in COMPS whereas D students reported no such overabundance and (2) A students reported preferring texts more often than D students.

Analysis by retention history showed that students who failed a grade in previous years showed the same profile as D and F students with the exceptions that they (1) felt they had more teacher time with COMPS and (2) found less creative use of math with COMPS.

Questions 15 and 20 were not included in the above analysis of the survey. Question 15 asked students to evaluate their reentry into a regular math program in ninth grade. Sixty-four percent of students reported that they did not have any trouble, sixteen percent used the neutral category, and twenty-one percent expressed some difficulty. Poor English grades appeared to be associated with difficulty in reentering a standard math program, whereas poor math grades and retention history did not appear to be associated with reentry.

Question 20 asked students to vote for one of four response categories that attempted to evaluate how much COMPS students would ideally like to have in the total school program. The most popular response was for COMPS to remain in the <u>eighth grade only</u>. Generally the survey data favored the

COMPS program. Students liked it. They learned a lot from it. They wanted to keep it. But when given the chance to extend it to other grades they did not vote overwhelmingly to extend it.

Table 1. Percent of Ninth Grade Students Responding to Each Item of an Allen County Survey of an Eighth Grade COMPS Math Program

	Strongly Agree	Moderately Agree	No Opinion	Moderately Disagree	Strongly Disagree
1. I liked the Comps program in 8th grade.	27.4	44.2	10.1	11.1	7.2
2. I felt I learned a lot of math last year.	32.4	42.9	10.0	10.5	4.3
3. It was easier for me to learn in last years' math class than it was in any other year.	31.9	20.0	9.0	19.0	20.0
4. In last years' math class we had examples and class activities that were more interesting than the ones we have in this years' math class.	24.4	23.9	15.8	20.1	15.8
5. I could figure out the math problems easier last year than I can this year.	22.9	18.6	16.2	25.7	16.7
6. I enjoyed working math problems more last year than I do this year.	18.1	16.7	19.5	21.9	23.8
7. I could discover answers to math problems last year quicker than I can this year.	16.7	18.6	20.5	28.6	15.7
8. My 8th grade math teacher had more time to help me individually than my 9th grade math teacher does.	16.3	15.3	20.6	17.2	30.6
9. If I had the choice, I would take a math class taught in the style like the one I had last year rather than the way math is taught this year.	20.0	15.7	21.0	16.7	26.7
10. I had to memorize a good deal more in last years' math class than I do in this years' class.	11.9	10.0	25.7	18.1	34.3
11. I enjoyed working in the small groups we had in last years' math class.	45.7	26.7	10.0	7.6	10.0
12. The instructions given to me by my math teacher were easier to understand last year than they are this year.	13.8	13.8	23.8	23.3	25.2
13. I had more time to finish the problems we worked in class last year than I do this year.	26.7	21.0	19.5	15.7	17.1
14. Math problems I took home and worked last year were easier to figure out than those I take home this year.	17.2	12.0	35.4	19.8	15.6
15. I didn't have any trouble switching from the type of math class I had last year, to the type I have this year.	33.8	30.5	15.7	9.5	10.5

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16.	I was able to "think for myself" more in last years' math class than I can in this years' math class.	9.0	13.3	34.3	23.8	19.5
17.	Last years' math class allowed me to be creative and use math in more ways than this years' math class.	10.7	23.4	32.2	19.0	14.6
18.	The Comps program gave me too much practice; I would have preferred to move along faster.	16.3	20.2	23.1	16.3	24.0
19.	I like working math problems from a textbook better than using material such as were used in the Comps program.	30.4	12.9	17.5	13.4	25.8

20. If I were a member of the Allen County School Board, I would vote to:

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Check ONE _____

35.9 COMPS program in eighth grade only.

23.0 Return the eighth grade math to the older way of teaching math.

14.8 Have a ninth grade COMPS program.

26.3 Teach all high school math the COMPS way.